

Scotch Universities are, we all know, too poor to create unattached professorships and endow them, standing as they do rather in need of endowment. Is it equally absurd to ask if one of the wealthy English Universities would not consider it an honour to rank Edward among its professors, and assist him to publish the observations he may yet have time to make, or does it merely show gross ignorance of the spirit in which they are governed to suppose that either of them could so far depart from the usual routine? I suppose I am not the only countryman of Edward who, having lived here long enough to learn how poor Norway treats her great men, will regret—not so much on account of Thomas Edward, for his has been a great life and example, but in the cause of science—that his lines have not fallen in pleasanter places.”

But Edward never complained of his lot, and had Mr. Smiles not written the present work, he would have had to stick to his stool to the end. All Edward ever wanted was some way of earning a living that would have enabled him to give more time and attention to his scientific pursuits, and no one will deny that it would have been immensely to the gain of science could his services have been devoted entirely to it, for he was too passionately fond of nature ever to have been spoiled by prosperity. But regrets are now useless; happily Edward is not beyond the reach of consolation and well-merited reward, and happily he is receiving them. He will be mentioned in the annals of science as an observer of the highest accuracy and originality, who gave up to a parish a genius fitted for an immensely wider sphere. The obvious moral of the work to those who have to spend most of their time in earning their daily bread, as well as to others, we need not point here. Mr. Smiles's work is one of the most interesting biographies ever written, and the illustrations gratuitously contributed by Mr. Reid are a great pleasure. Our readers by buying the book will not only become possessed of a rare treat, but will at the same time help to confer a substantial benefit upon Thomas Edward, the Scottish Naturalist.

BLAKE'S "ASTRONOMICAL MYTHS"

Astronomical Myths. Based on Flammarion's "History of the Heavens." By John F. Blake. (London: Macmillan and Co., 1877.)

IN the continual turmoil of daily life, when each one is looking forward to new methods and new discoveries, we seldom or never look back into the doings of our early predecessors, and even when we do we are somewhat inclined to pity their ignorance and their, to us, absurd notions. We ought rather to call to mind the difficulties under which the great men of old laboured, difficulties under which our present leaders in astronomy would probably have been equally sorely tried. We must remember that we have all the sister sciences lending their aid, and that therefore the advance in astronomy should be made with constantly increasing strides.

The author of this work has put before us the labour of M. Flammarion in an English dress, and has added other matters—notably a chapter containing the researches of Mr. Haliburton on the Pleiades, to many the most interesting part of the book. We are carried back to the time when nations thought as the child did in the lines of Tom Hood, quoted by the author:—

“I remember, I remember, the fir trees straight and high,
And how I thought their slender tops were close against the sky;
It was a childish fantasy, but now 'tis little joy,
To know I'm further off from heaven than when I was a boy.”

Mr. Blake commences by calling attention to the contemplation by our ancestors of the awe-inspiring phenomena of the heavens by night, the rising and setting of the sun, moon, and planets, the slow and silent motion of the constellations from east to west. To them the sky was a lofty canopy studded with stars, the earth a vast plain, the solid basis of the universe. Two distinct regions appeared to compose the whole system—the upper one, or the air, in which were the moving stars, and the firmament over all; and the lower one, the earth and the sea.

It is to be expected that in early times religious beliefs and rites were mixed up with and were derived from the motions and appearance of the heavenly bodies. The Druids appear to have seen or imagined that the moon was a body like the earth, having mountains, and, according to Plutarch, furrowed with several Mediterranean seas, which the Grecian philosophers compared to the Red and Caspian seas. This celestial earth was supposed by the western theologians to be the abode of departed souls, the place of immortality. The festivals were therefore ranged accordingly, and the Druids were represented as holding a crescent in their hands.

The origin of the names of the constellations has always been a source of speculation, and the chapter on this subject is well worth study. For the names of several of them there appears to be some show of reason, but others have been named from mere caprice, or in honour of some person or event. In the case of the “Locks of Berenice,” the story goes that Berenice was the spouse and sister of Ptolemy Euergetes, and that she made a vow to cut off her locks and devote them to Venus if her husband returned victorious, and, to console the king, the astrologer placed her locks among the stars. The Great Bear, the *Ἀρκτος μεγάλη* of the Greeks, the Okouari (bear) of the Iroquois may have been so called, as Aristotle observes, because the bear is the only animal that dared venture into the regions of the north. The Arabs called the bears the great and little coffins, and the Christian Arabs made the Great Bear the grave of Lazarus, and the three weepers Mary, Martha, and their maid.

The history of the signs of the zodiac is traced downwards in the several nations, and it is pointed out that the names may have originated in the rising of constellations at the times of certain important events, as Aquarius at the time of the inundation at Thebes, and the Bull at the time of ploughing, but this does not account for all. Further, we find how the precession of the equinoxes furnishes us with a means of fixing the date of the signs receiving their names; at that date the names of the signs of course corresponded to the zodiacal constellations, and if we find in any description that the equinox is said to be in the sign of the Bull we know that the method of naming dates back to some 3,000 years ago, for at that period the equinox happened in the constellation of the Bull. According to our present nomenclature the equinox happens in Aries, but really when the sun is in Pisces; our method therefore dates back to about 2,300 years ago when the equinox was in the constellation of

Aries, or more probably to the time of Hipparchus, when the equinox was exactly at the star β Arietis. It occurs to us that the worship of the Bull and Golden Calf was in vogue during the time that the equinox happened in the constellation of Taurus, that the Ram and Lamb were held in estimation at a later date when the equinox happened in the constellation of Aries.

The most prominent group of stars in the heavens—the Pleiades—has always been an object of attention, and we are glad to find an interesting chapter on this subject based on the careful work of Mr. Haliburton. The Pleiades, we learn, were observed for the purpose of dividing the year into two parts—one “the Pleiades above,” and the other “the Pleiades below.” During one half-year, while they were east of the sun, they would be visible at sunset and the reverse during the other half. The culmination of the Pleiades at midnight appears to have been with many nations the starting-point of the year, and here again the precession of the equinoxes has an interesting effect, since the tropical year is shorter than the sidereal. Thus the dates of the latter keep advancing on those of the former, and so long as dates were regulated by the stars all the countries would agree in the time of their festivals; but, as the author puts it, “as soon as a solar calendar was arranged, and it was found that at that time this position coincided with a certain day, say the Pleiades culminating at midnight on November 17, then some would keep on the date November 17 as the important day, even when the Pleiades no longer culminated at midnight then, and others would keep reckoning by the stars, and so have a different date.”

The instance given of the 17th November seems to be somewhat strange, for, on referring to our star maps, it appears that the Pleiades culminate now at midnight on or about the 14th November, and years ago the midnight culmination took place of course earlier in the year. It is, however, possible that judgment of the date of midnight culmination was in error.

Mr. Blake then goes on to point out that a new year's festival determined by the Pleiades is the most universal of customs. The Australians hold their new year's corroboree in November at the midnight culmination, and in India the year was determined by the Pleiades, and on the 17th day of November is celebrated the Hindoo Durga, the festival of the dead, and new year's commemoration. So also the Egyptians regulated their solar calendar that the day might be unchanged, and the commemoration of the dead took place on the 17th of their month Athyr, the same date at which the Mosaic account of the deluge makes the same commence. This, we agree with the author, is no chance coincidence.

We cannot think, however, that the explanation of the origin of November 17 is clear, for although some 4,000 years ago the equinoctial point was close to the Pleiades, there appears no particular reason that the day on which the equinox happened when near that group would be called November 17, and if it was so called how comes it that the midnight culmination happens now within three days of the same date, while our calendar has continually been changing with reference to sidereal events? If we assume that the commemorations of India and other places are kept on the day of midnight culmination of this group,

without reference to the calendar, then the events would happen now without much error on November 17, and will happen on December 17 some 2,200 years hence, and if we reckon back according to our calendar to a time—to some 4,000 years ago—the culmination and festivals would have happened on the autumnal (spring of the southern hemisphere) equinox—September 21. We do not see from the text how the Egyptian and Mosaic dates of November 17, although perhaps connected together, can have any connection with the festivals of other nations kept on that date in modern times. The calendar might have been arranged to suit the sidereal year up to a comparatively late date, but our calendar has been fitted to the tropical year much too long to allow, at its commencement, the midnight culmination of the Pleiades to have happened anywhere near November 17.

In other words, the festivals depending on the midnight culmination of the Pleiades will necessarily be kept on or about the same day, and that day happens to be February 14, or, say November 17; now unless the calendar be a sidereal one, which it is not, this festival must have, in bygone years, happened earlier than November 17. It would seem, therefore, that some other event than the culmination of the Pleiades happened, by which the Mosaic and Egyptian date of November 17 was fixed.

The further account of the Pleiades and the relation to the passage in the Pyramid of Gizeh, as investigated by Piazzzi Smyth, is extremely interesting.

In the chapter on astronomical systems there is much worth reading, and the diagrams show the gradual advance of observation and order over imagination, and it seems curious to us at the present time that the ancients should have gone so far out of their way to describe the earth as a flat surface floating, with roots, on pillars, on the backs of elephants standing on a tortoise, as a portion of a cylinder, as cubical, or as having various other forms. The geography and cosmography are no less interesting, and a large number of diagrams of maps are given, many of which appear to have been made to suit the superstitious ideas of the fathers of the various churches rather than the results of observation.

The chapters on Eclipses and Comets, with the anecdotes of the consternation and awe produced by their appearance, give us a very correct idea of the all-supreme superstition of the middle and earlier ages; but even now among civilised nations there appears to be a large amount of superstition to be eradicated.

OUR BOOK SHELF

Acoustics, Light, and Heat. By William Lees, M.A., &c. Glasgow: Collins, Sons, and Co., 1877. (Collins's Advanced Science Series.)

THIS is a good specimen of a series of text-books, among which Dr. Guthrie's capital compendium of Magnetism and Electricity, and several other valuable works have appeared. It is stated, in a brief preface, to be founded on notes of the late Dr. W. S. Davis of Derby, who was to have undertaken its preparation, and to whom the first chapter, as well as the Appendix on the Doctrine of Energy, are due.

Text-books are far from easy to write in a satisfactory manner; by their very definition and nature they contain no novelty, except such as can be secured by clear treatment and lucid exposition of subjects already familiar.